

I Claim:

1. A baseball bat having an outermost striking surface comprising:
  - a solid lightweight foam core, said core comprising:
    - a shaft having a longitudinal handle portion at one end of the bat for manipulation by a user during use of the bat, and a longitudinal striking portion at a second opposite end of the bat for striking by the user; and
    - a singular external polymer composite skin rigidly bonded with an adhesive resin directly to the exterior surface of said handle portion and said striking portion of said core, said polymer composite skin comprising fibers impregnated with said resin and forming the outermost striking surface of the bat,
  - whereby the weight of the bat is lower than the weight of a conventional metal or wood bat and whereby the strength, durability and performance of the bat is improved.
2. The baseball bat of claim 1, wherein the density of said foam is in the range of between 5 and 20 pounds per cubic foot.
3. The baseball bat of claim 1, wherein the thickness of said singular external polymer composite skin is on the order of .04 inches.
4. The baseball bat of claim 1, wherein the thickness of said singular external polymer composite skin is in the range of from .02 inches to .06 inches.
5. The baseball bat of claim 1, wherein said polymer composite skin has a density in the range of between 100 and 130 pounds per cubic foot.
6. The baseball bat of claim 1, including one or more additional polymer composite skins rigidly bonded with an

adhesive resin to the exterior of said singular external polymer composite skin, wherein said one or more additional polymer composite skins comprise fibers impregnated with said resin and forms the outermost striking surface of the bat.

7. A baseball bat having an outermost striking surface comprising:

a lightweight core, said core comprising:

a shaft having a longitudinal handle portion at one end of the bat for manipulation by a user during use of the bat, said handle portion made of a lightweight material other than foam, and a longitudinal striking portion at a second opposite end of the bat for striking by the user, said striking portion made of a lightweight foam; and

a singular external polymer composite skin rigidly bonded with an adhesive resin directly to the exterior surface of said handle portion and said striking portion of said core, said polymer composite skin comprising fibers impregnated with said resin and forming the outermost striking surface of the bat,

whereby the weight of the bat is lower than the weight of a conventional metal or wood bat and whereby the strength, durability and performance of the bat is improved.

8. The baseball bat of claim 7, wherein said lightweight material of said handle portion is selected from a group of lightweight materials consisting of lightweight hardwood, plastic, aluminum, polymer composite and combinations thereof.
9. The baseball bat of claim 7, wherein said handle portion is a hollow void tube and said lightweight material of said handle portion is selected from a group of lightweight materials consisting of, plastic, aluminum, polymer composite and combinations thereof.

10. The baseball bat of claim 7, wherein the density of said foam is in the range of between 5 and 20 pounds per cubic foot.
11. The baseball bat of claim 7, wherein the thickness of said singular external polymer composite skin is on the order of .040 inches.
12. The baseball bat of claim 7, wherein the thickness of said singular external polymer composite skin is in the range of from .02 inches to .06 inches
13. The baseball bat of claim 7, wherein said polymer composite skin has a density in the range of between 100 and 130 pounds per cubic foot.
14. The baseball bat of claim 7, wherein a portion of said handle portion extends into and is encased by said striking portion.
15. The baseball bat of claim 14, wherein said portion of said handle portion extends into said striking portion for up to the entire length of said striking portion.
16. The baseball bat of claim 7, including one or more additional polymer composite skins rigidly bonded with an adhesive resin to the exterior of said singular external polymer composite skin, wherein said one or more additional polymer composite skins comprise fibers impregnated with said resin and forms the outermost striking surface of the bat.
17. A baseball bat having an outermost striking surface comprising:
  - a solid lightweight foam core, said core comprising:
    - a shaft having a longitudinal handle portion at one end of the bat for manipulation by a user during use of the bat, and a longitudinal striking portion at

a second opposite end of the bat for striking by the user; and

two or more external polymer composite skins rigidly bonded with an adhesive resin directly to the exterior surface of said handle portion and said striking portion of said core, said polymer composite skins comprising fibers impregnated with said resin and forming the outermost striking surface of the bat,  
whereby the weight of the bat is lower than the weight of a conventional metal or wood bat and whereby the strength, durability and performance of the bat is improved.

18. The baseball bat of claim 17, wherein the density of said foam is in the range of between 5 and 20 pounds per cubic foot.
19. The baseball bat of claim 17, wherein the thickness of each of said two or more polymer composite skins is on the order of .040 inches.
20. The baseball bat of claim 17, wherein the thickness of each of said two or more polymer composite skins is in the range of from .02 inches to .06 inches
21. The baseball bat of claim 17, wherein said two or more polymer composite skins have a density in the range of between 100 and 130 pounds per cubic foot.
22. A baseball bat having an outermost striking surface comprising:  
a lightweight core, said core comprising:  
a shaft having a longitudinal handle portion at one end of the bat for manipulation by a user during use of the bat, said handle portion made of a lightweight material other than foam, and a longitudinal striking portion at a second opposite end of the bat for striking by the user, said striking portion made of a lightweight foam; and

two or more external polymer composite skins rigidly bonded with an adhesive resin directly to the exterior surface of said handle portion and said striking portion of said core, said polymer composite skins comprising fibers impregnated with said resin and forming the outermost striking surface of the bat,  
whereby the weight of the bat is lower than the weight of a conventional metal or wood bat and whereby the strength, durability and performance of the bat is improved.

23. The baseball bat of claim 22, wherein said lightweight material of said handle portion is selected from a group of lightweight materials consisting of lightweight hardwood, plastic, aluminum, polymer composite and combinations thereof.
24. The baseball bat of claim 22, wherein said handle portion is a hollow void tube and said lightweight material of said handle portion is selected from a group of lightweight materials consisting of, plastic, aluminum, polymer composite and combinations thereof.
25. The baseball bat of claim 22, wherein the density of said foam is in the range of between 5 and 20 pounds per cubic foot.
26. The baseball bat of claim 22, wherein the thickness of each of said two or more external polymer composite skins is on the order of .040 inches.
27. The baseball bat of claim 22, wherein the thickness of each of said singular external polymer composite skins is in the range of from .02 inches to .06 inches
28. The baseball bat of claim 22, wherein said two or more polymer composite skins have a density in the range of between 100 and 130 pounds per cubic foot.

29. The baseball bat of claim 22, wherein a portion of said handle portion extends into and is encased by said striking portion.
30. The baseball bat of claim 29, wherein said portion of said handle portion extends into said striking portion for up to the entire length of said striking portion.